User's Manual

Version 1.0

Em104-n513

Em104-n513VL
PC/104 NS GX1 Module one SODIMM up to 256 MB SDRAM , NS CS5530A Flat Panel / CRT SVGA , Fast Ethernet

Introduction

Arbor's product of Em104-n513 is a PC-104 with an on-board embedded x86-compatible 32 bit processors, NS Geode GX1-300 processor. With this board, system engineers will be able to upgrade 386-based or 486-based to 586-level without some additional worries, because a NS Geode GX1-300 processor is mounted on Em104-n513 and DRAM supports up to 256MB on SODIMM. No longer worry about the CPU installation , don't need to set any jumpers of speed or voltage of processor . And the fan is not necessary for NS Geode Gx1-300 , the MTBF worries will be reduced . DRAM on-board will improve the ability of the anti-vibration . Em104-n513 has the good reliability for system designer .

With its ultra low power, rich levels of integration, advanced multimedia capabilities and communication features, this board is an exciting opportunity for System Integrators and OEMs to develop new generation products that meet the desires and aspirations of the 21th century consumers.

Table of Contents

Introduction 2

Specifications 5

Board Image 7

Board Layout 9

Board Layout Rear Side 10

Jumper/Connector Quick Reference 11

Jumper/Connector Quick Reference 12

CMOS Jumper Settings 13

Serial Port Selection (RS232C/422/485) 14

Watchdog Timer 15

Fast Ethernet Connectors 24

Power Connector 25

Interface Connectors HDD, FDD 26

Peripheral Port 28

USB Ports 29

SIR 29

VGA Displayer Connector 30

PS/2 Keyboard & Mouse 30

COM1 & COM2 for RS-232C Port 31

Compact Flash Connector 32

Flat Panel VGA 33

Front Panel Connector 34

ISA PC-104 Interface 35

LAN Act and Link LED pin header 37

System Resources 38

AWARD BIOS Setup 40

Setup Items 40
Standard CMOS Setup 42
IDE HDD AUTO DETECTION 44
BIOS Features Setup 46
Chipset Features Setup 49
Power Management Setup 51
PnP/PCI Configuration 52
Integrated Peripherals 53

POST Codes 55

Howto : Flash the BIOS 62

What if things go wrong 63

Warranty 64

Specifications

General Specifications

- **CPU** : NS Geode GX1 300MHz MHz with FSB 33MHz.
- **Chipset** : NS CS5530A.
- **BIOS** : AWARD® Flash BIOS
- **Green Function** : power saving supported in BIOS. DOZE / STANDBY APM
- **L1 Cache** : Integrated on CPU
- **DRAM Memory** : up to 256MB of SDRAM on SODIMM (144-pin), Total of 256MB Memory
- **Enhanced IDE with UltraDMA** : supports single port and up to 2 ATAPI devices, Ultra DMA transfer 33 MB/sec. One 44-pin (2.0 pitch) box header.
- **Watchdog Timer** : 1~255 minitues generates RESET when your application loses control over the system.
- **Real-time Clock** : built-in chipset with lithium battery backup. CMOS data backup of BIOS setup and BIOS default.

High Speed Multi I/O

- **Chipset** : Winbond 83977F-A
- **Serial Ports** : Two high speed RS-232C ports (COM1). One high speed RS-232C/422/485 port COM2 (jumper selectable). Both with 16C550 compatible UART.
- **USB** : 2 onboard USB prots Ver 1.1.
- **SIR Interface** : onboard IrDA TX/RX port
- **Floppy Disk Drive Interface** : 2 floppy disk drives, 3.5" (720 KB, 1.44 MB or 2.88 MB).
- **Bi-directional Parallel Port** : SPP, EPP and ECP mode.
- **Keyboard and Mouse Connectors** : external PS/2 KB/Mouse port (6-pin box header)

Network Interface Controller

- **Chipset** : Single Realtek 8100BL, 10/100 Mbps
- **Connector** : Onboard 10-pin header

Display Controller

- **Chipset** : CS5530A, shared display memory up to 4MB
- **Display Type** : CRT (VGA, SVGA, XGA, SXGA) and 18-bit TFT LCD TV-Out
- **Connectors** : Onboard 40-pin header (DF 13-40 DP-1.25V)
- **Resolution**: >Em104-n513/VL CRT resolutions up to 1280x1024 @ 256 colors or 1204x768 @ 16bit. Panel resolutions up to 1280x1024 @ 8bpp or 1024x768 @ 16bpp.

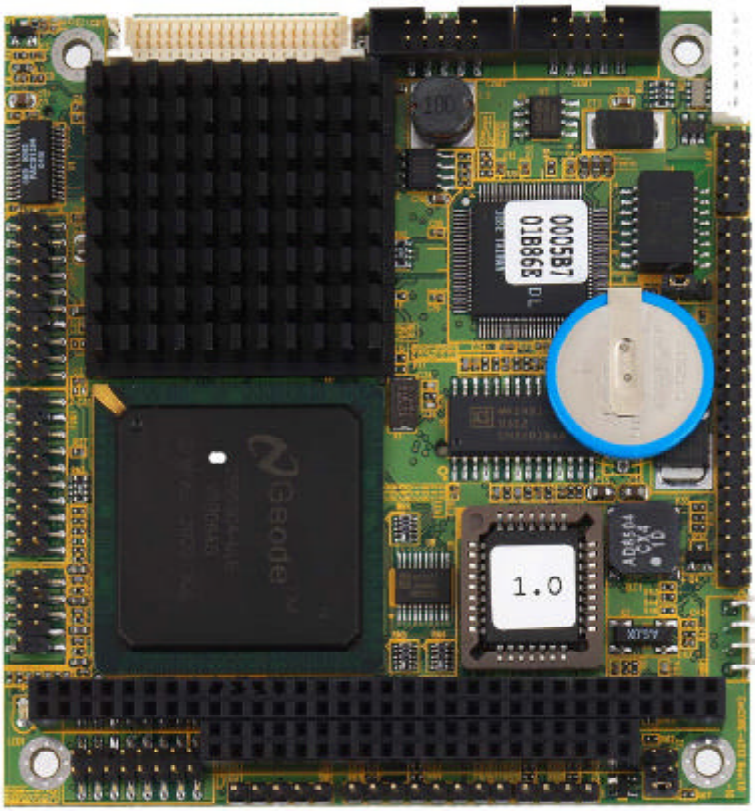
SSD Interfaces

- **Compact Flash Card (CFC)**
  - **Compact Flash Socket :** supports Type I/II CFC
  - **Capacity** : up to 512MB CFC

Environmental and Power

- **Power Requirements** : +5 V @ 0.97 A (typical);(Low Power Embedded NS Geode GX1 300MHz and 256MB SDRAM)
- **Board Dimensions** : 90mm x 96mm
- **Board Weight :** 0.1kg
- **Operating Temperature** : 0 to 60˚C (32 to 140˚F)
- **Operating Humidity** : 0%~90%

Board Image



Warning

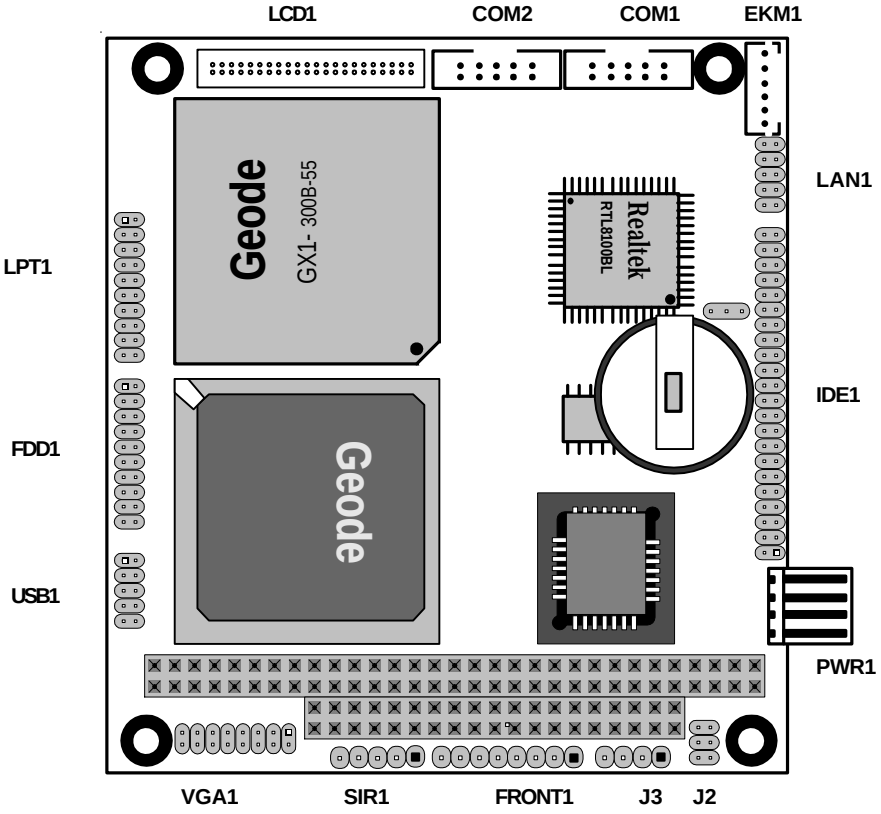
Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system

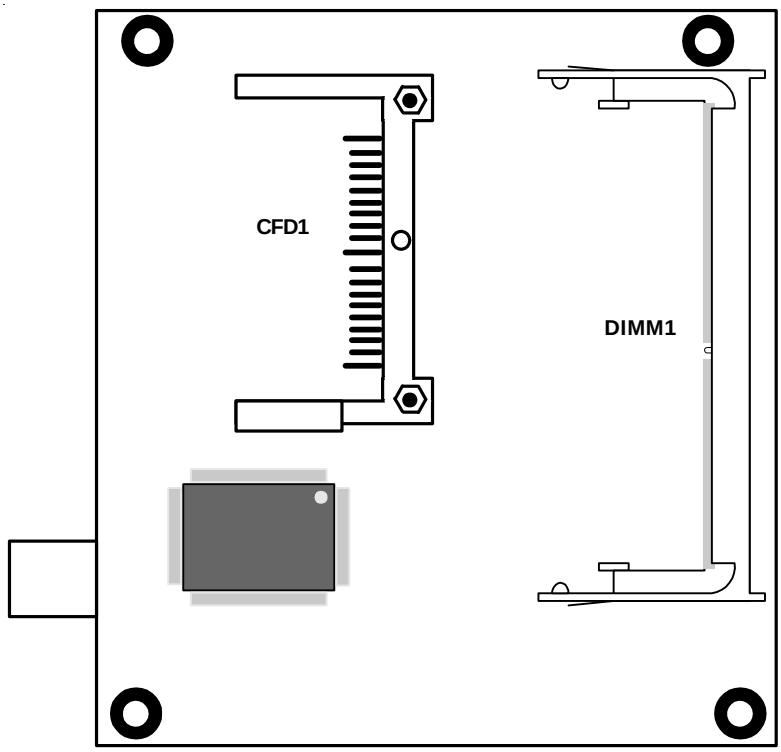
Ordering Codes

Em104-n513VL
PC/104 NS GX1 Module one SODIMM up to 256 MB SDRAM , NS CS5530A Flat Panel / CRT SVGA , Fast Ethernet

Board Layout



Board Layout Rear Side



Jumper/Connector Quick Reference

Jumpers

Label	Function
J1	Clear CMOS
J2	COM2 RS-232C / 422 / 485 Selection

Jumper/Connector Quick Reference

Connectors	
Label	Function
VGA1	VGA Display Connector
LCD1	LCD Connector
IDE1	Primary IDE Connector
CFD1	Compact Flash Connector
USB1	USB Port 0,1
SIR1	Infrared (IR) Connector
EKM1	Keyboard and PS/2 Mouse
FDD1	Floppy Drive Connector
LAN1	10/100M LAN1 Connector
LPT1	Parallel Port
COM1	RS-232C Serial Port
COM2	RS-232C/422/485 Serial Port
PWR1	Small 4P Power Connector
PC104	ISA PC-104 Interface
FRONT1	Front Panel Connector
J3	LAN Act and Link LED pin header
DIMM1	SODIMM Socket

CMOS Jumper Settings

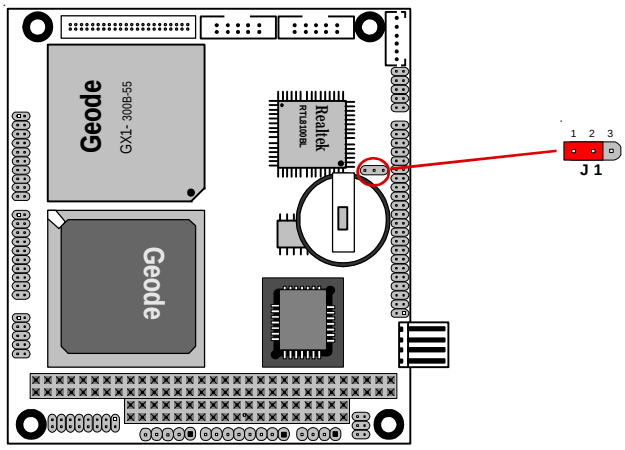
CMOS Operation (J1)

Type : J1: onboard 3-pin header

If the Em104-n513 refuses to boot due to inappropriate CMOS settings here is how to proceed to clear (reset) the CMOS to its default values.

CMOS Setup (J1)	J1	Status
Normal Operation	1-2	ON
Clear CMOS	2-3	ON

default setting 1-2 ON



Serial Port Selection (RS232C/422/485)

RS-232C/422/485 Mode select (J2)

Type : J2: onboard 6-pin(2*3) header

J2 Selection	1-2	3-4	5-6
RS-232C	ON	OFF	OFF
RS-422	OFF	ON	OFF
RS-485	OFF	OFF	ON

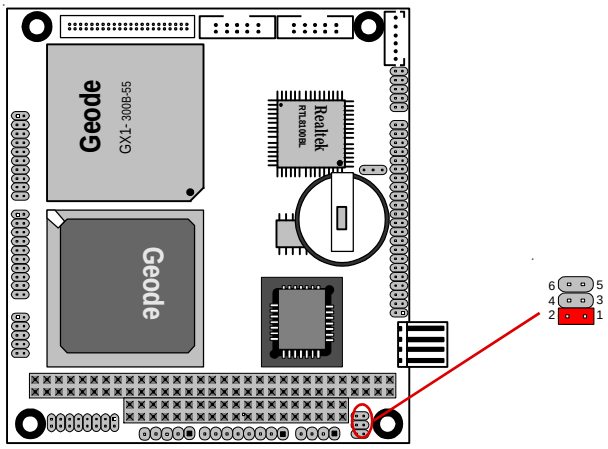
default setting RS-232C

RS-422/485 Mode on COM2

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper J2 switches between RS-232C or RS-422/485 mode. All of the RS-232C/422/485 modes are available on COM2.

COM2

Pin Defined:	RS-232C	RS-422	RS-485
Pin1 :	DCD	Tx-	Data+
Pin2 :	RXD	Tx+	Data-
Pin8 :	CTS	Rx+	x
Pin9 :	RI	Rx-	x



Programming Example

The following program is an examples of how to enable, disable and refresh the Watchdog timer:

```
;Rev     Date              Description
;-------------------------------------------------------------------------------
;R00     04/04/03          For W83977F-A WDT utility.



Secondio_Config_Port     equ      3F0h
Input_Loop               equ      30

                .model   small
                .386
                .code

                jmp      Secondio_Early_Prg

Secondio_Early_Prg:
                mov      ax,@data
                mov      ds,ax
                mov      es,ax
                xor      ax,ax

                lea      dx,topstr
                mov      ah,09
```

```
        int     21h

        lea     dx,buffer
        mov     ah,0ah
        int     21h

        call    ASCII_2_HEX

        lea     dx,endstr
        mov     ah,09
        int     21h

        call    Secondio_Enter_Config
        mov     si, offset cs:Secondio_Init_Tbl
        mov     cx, Secondio_Init_Counter

Init_Secondio_Register:
        push    cx
        mov     cl, byte ptr cs:[si]
        inc     si
        mov     al, byte ptr cs:[si]
        inc     si
        call    Secondio_Set_Reg
        pop     cx
        loop    short Init_Secondio_Register
        call    Secondio_Exit_Config
```

```
Secondary_Prg_Super_IO_Chip:
        call    Secondio_Enter_Config

Set_Watch_Dog_Timer:
        mov     cl,8
        call    Secondio_Set_Logic_Device
        mov     al, buffer1
        mov     cl, 0f2h
        call    Secondio_Set_Reg

End_Secondary_Prg_Super_IO_Chip:
        call    Secondio_Exit_Config

        call    Show_Message
        mov     ah,4ch
        int     21h

Secondio_Init_Tbl:
        db      02ch,   010h    ;Enable_Secondio_Support_Watch_Dog
        db      007h,   007h
        db      0e6h,   00ah
Secondio_Init_Counter   EQU     ($ - Secondio_Init_Tbl) / 2

Secondio_Enter_Config:
        mov     dx, Secondio_Config_Port
        mov     al, 87h
        out     dx, al
```

```
        out     dx, al
        ret

Secondio_Exit_Config:
        mov     dx, Secondio_Config_Port
        mov     al, 0AAh
        out     dx, al
        ret

Secondio_Set_Reg:
        push    ax
        mov     dx, Secondio_Config_Port
        mov     al, cl
        out     dx, al
        pop     ax
        inc     dx
        out     dx, al
        ret

Secondio_Set_Logic_Device:
        mov     al, cl
        mov     cl, 7
        call    Secondio_Set_Reg
        ret

Secondio_Set_Dev_Active:
        mov     cl, 30h
```

```
        call    Secondio_Set_Reg
        ret

Secondio_Set_Port:
        mov     cl, 60h
        mov     al, bh
        call    Secondio_Set_Reg
        mov     cl, 61h
        mov     al, bl
        call    Secondio_Set_Reg
        ret

Secondio_Set_Irq:
        mov     al, ch
        mov     cl, 70h
        call    Secondio_Set_Reg
        ret

ASCII_2_HEX:
        xor     ax,ax
        mov     buffer1,al
        mov     buffer2,al
        mov     bx,0
        mov     al,Input_Loop
        inc     ax
        mov     cx,ax
next:
```

```
                lea     si,buffer_data
                lea     di,str_data[bx]
                cmpsd
                je      scan_yes
                add     bx,8
                loopne  next
scan_no:
                mov     al,0ffh
                mov     buffer2,al
                mov     al,0
                mov     buffer1,al
                ret
scan_yes:
                dec     cl
                mov     al,cl
                mov     buffer1,al
                lea     si,str_data[bx+4]
                lea     di,wdtsecstr
                movsd
                ret

Show_Message:
                mov     al,buffer2
                cmp     al,0ffh
                jnz     show_wdt_dis
                lea     dx,errstr
                mov     ah,09h
```

```
                int     21h
                jmp     show_end
show_wdt_dis:
                mov     al,buffer1
                cmp     al,00h
                jnz     show_wdt_en
                lea     dx,wdtstr
                mov     ah,09h
                int     21h
                lea     dx,wdtdis
                mov     ah,09h
                int     21h
                jmp     show_end
show_wdt_en:
                lea     dx,wdtstr
                mov     ah,09h
                int     21h
                lea     dx,wdten
                mov     ah,09h
                int     21h
show_end:
                lea     dx,endstr
                mov     ah,09h
                int     21h
                ret

                .stack
```

```
                .data
topstr          db      0ah,0dh
                db      'Arbor Industrial PC-based Automation',44 dup(0)
                db      'Winbond W83977F-A Superio I/O Watch Dog Timer Utility'
                db      27 dup(0)
                db      'Version: T1.0'
                db      0ah,0dh,0ah,0dh
                db      '0=Disabled,1=16sec,2=32sec,3=48.....30=480sec'
                db      0ah,0dh
                db      'Input : ','$'
buffer          db      04h
buffer_num      db      00h
buffer_data     db      00h,00h,00h,00h,'$'
buffer1         db      00h
buffer2         db      00h
str_data        db      33h,30h,0dh,00h,' 480'   ;30
                db      32h,39h,0dh,00h,' 464'   ;29
                db      32h,38h,0dh,00h,' 448'   ;28
                db      32h,37h,0dh,00h,' 432'   ;27
                db      32h,36h,0dh,00h,' 416'   ;26
                db      32h,35h,0dh,00h,' 400'   ;25
                db      32h,34h,0dh,00h,' 384'   ;24
                db      32h,33h,0dh,00h,' 368'   ;23
                db      32h,32h,0dh,00h,' 352'   ;22
                db      32h,31h,0dh,00h,' 336'   ;21
                db      32h,30h,0dh,00h,' 320'   ;20
                db      31h,39h,0dh,00h,' 304'   ;19
```

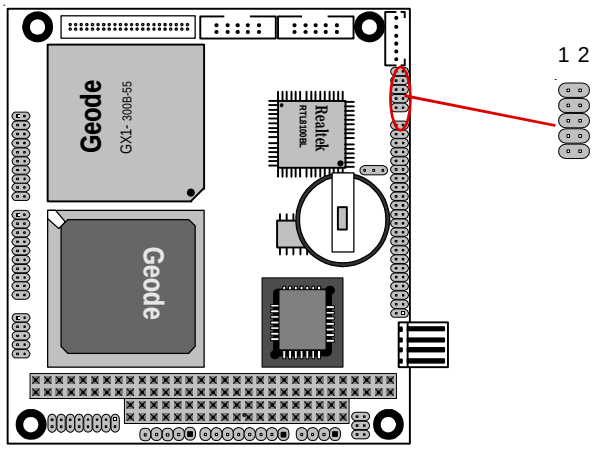
```
                db      31h,38h,0dh,00h,' 288'  ;18
                db      31h,37h,0dh,00h,' 272'  ;17
                db      31h,36h,0dh,00h,' 256'  ;16
                db      31h,35h,0dh,00h,' 240'  ;15
                db      31h,34h,0dh,00h,' 224'  ;14
                db      31h,33h,0dh,00h,' 208'  ;13
                db      31h,32h,0dh,00h,' 192'  ;12
                db      31h,31h,0dh,00h,' 176'  ;11
                db      31h,30h,0dh,00h,' 160'  ;10
                db      39h,0dh,00h,00h,' 144'  ;9
                db      38h,0dh,00h,00h,' 128'  ;8
                db      37h,0dh,00h,00h,' 112'  ;7
                db      36h,0dh,00h,00h,'  96'  ;6
                db      35h,0dh,00h,00h,'  80'  ;5
                db      34h,0dh,00h,00h,'  64'  ;4
                db      33h,0dh,00h,00h,'  48'  ;3
                db      32h,0dh,00h,00h,'  32'  ;2
                db      31h,0dh,00h,00h,'  16'  ;1
                db      30h,0dh,00h,00h,'    '  ;0
wdtstr          db      0ah,0dh,'Watch Dog Timer Reset System ','$'
wdtdis          db      'Disabled','$'
wdten           db      'After'
wdtsecstr       db      '0000 '
secondstr       db      'Sec','$'
errstr          db      0ah,0dh,'Input Error','$'
endstr          db      0ah,0dh,'$'

                end
```

Fast Ethernet Connectors

10 / 100M LAN1 Connector

Connector : **LAN1**
Type : Onboard 10-pin header

Pin	Description	Pin	Description
1	TX+	2	TX-
3	RX+	4	NC
5	NC	6	RX-
7	NC	8	NC
9	GND	10	GND



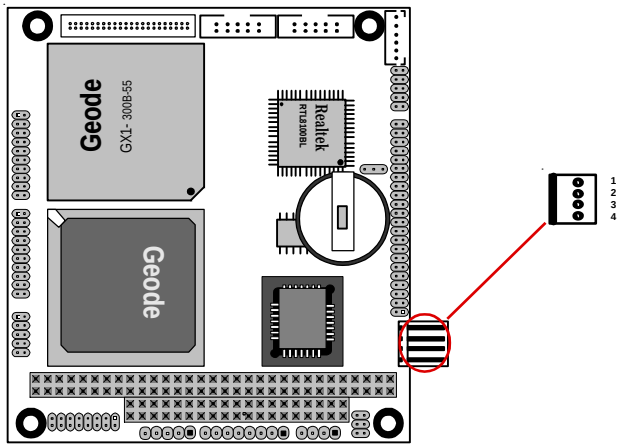
Power Connector

Power Connector : PWR1

Connector : **PWR1**

Type : PWR1: onboard small 4P connector

Pin	Description	Pin	Description
1	+5V	2	GND
3	GND	4	+12V

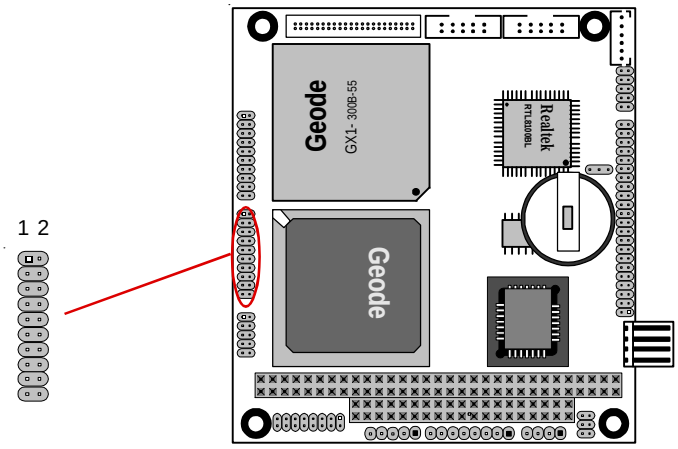


Interface Connectors HDD, FDD

Floppy Disk Drive Connector

Connector : **FDD**
Type : onboard 34-pin box header

Pin	Description	Pin	Description
1	GND	2	RWC
3	GND	4	NC
5	GND	6	DS1
7	WDATA	8	INDEX
9	WE	10	MOA
11	TRACK0	12	DSB
13	WP	14	DSA
15	RDATA	16	MOB
17	HEAD	18	DIR
19	DSKCHG	20	STEP

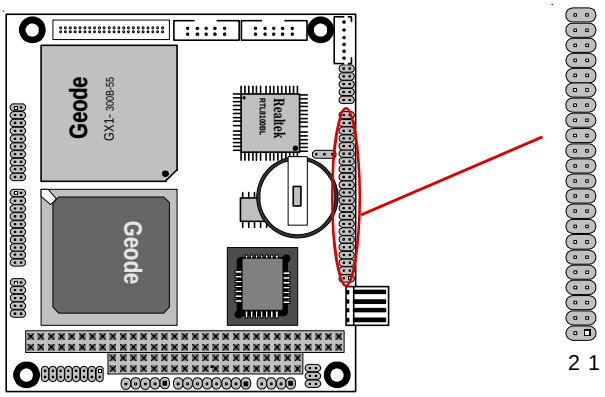


Enhanced IDE1 Connector

Connector : IDE1

Type : One onboard 44-pin box headers, primary IDE

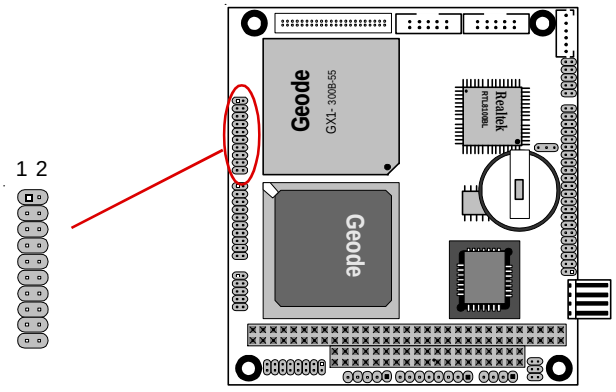
Pin	Description	Pin	Description
1	#RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	REQ	22	GND
23	#IOW	24	GND
25	#IOR	26	GND
27	#IORDY	28	IDESEL
29	#DACK	30	GND
31	IRQ	32	NC
33	ADDR1	34	CBLID
35	ADDR0	36	ADDR2
37	#CS0	38	#CS1(#HD SELET1)
39	#ACT	40	GND
41	Vcc	42	Vcc
43	GND	44	GND



Peripheral Port

Connector : **LPT1**
Type : onboard 26-pin box header

Pin	Description	Pin	Description
1	STB	2	AFD
3	PD0	4	ERR
5	1	6	INIT
7	2	8	SLIN
9	3	10	GND
11	4	12	GND
13	5	14	NC
15	6	16	BUSY
17	7	18	PE
19	ACK#	20	SLCT



USB Ports

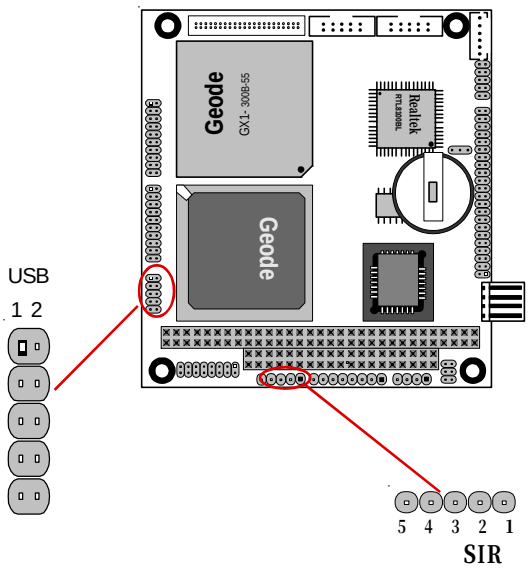
Connector: **USB1**
Type:onboard Two USB ports

Pin	Description	Pin	Description
1	VCC	2	VCC
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND
9	GND	10	NC

SIR

Connector : **SIR1**
Type : onboard 5-pin header

	Pin	Description	Pin	Description
	1	Vcc	2	NC
	3	IRRX	4	GND
	5	IRTX		



VGA Displayer Connector

Connector : **VGA1**
Type : Onboard 16-pin header

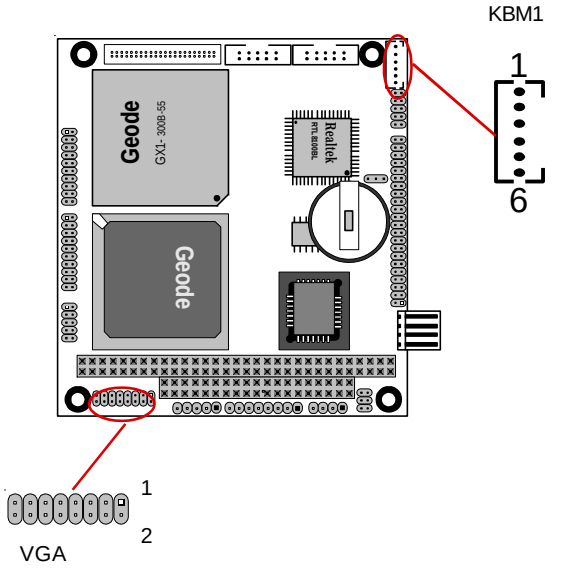
Pin	Description	Pin	Description	Pin	Description
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	I2C-DATE
3	BLUE	8	GND	13	HSYNC
4	NC	9	Vcc	14	VSYNC
5	GND	10	GND	15	I2C-CLK
16	NC				

PS/2 Keyboard & Mouse

Connector: **KMB1**
Type: Onboard 6-pin box header

Pin	Description	Pin	Description
1	KB-DATA	2	GND
3	MS-DATA	4	KB-CLK
5	+5V	6	MS-CLK

Note: KB1 supports PS/2 keyboard directly, and PS/2 mouse suppoted with the additional PS2 1-to-2 cable in the standard packing.



COM1 & COM2 for RS-232C Port

Connector : **COM1 & COM2**
Type : onboard 10-pin box header

COM1 for RS-232

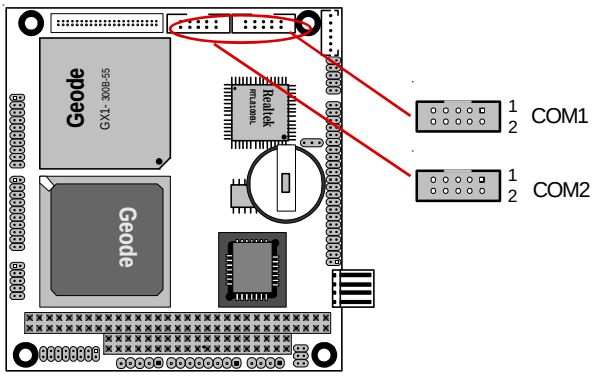
Pin	Description	Pin	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

COM1 for RS-422

Pin	Description	Pin	Description
1	TX+	2	TX-
3	NC	4	NC
5	GND	6	NC
7	NC	8	RX+
9	RX-	10	NC

COM1 for RS-485

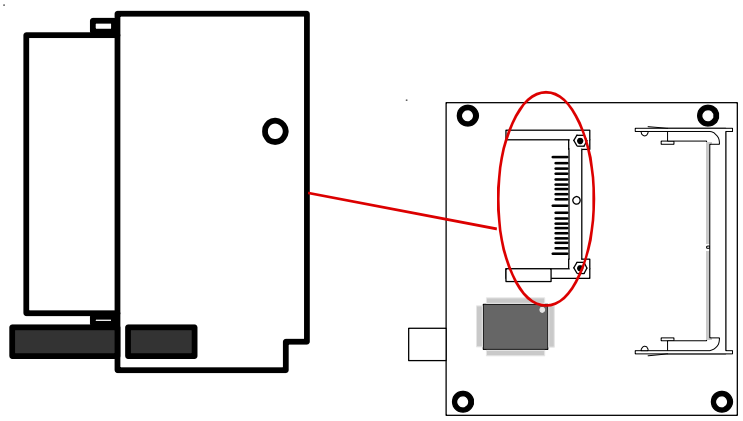
Pin	Description	Pin	Description
1	DATA+	2	DATA-
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	NC



Compact Flash Connector

Connector : **CFD1**
Type : 50-pin compact flash type I/II

Pin	Description	Pin	Description	Pin	Description
1	GND	18	ADDR2	35	IO WRITE
2	DATA3	19	ADDR1	36	+5V
3	DATA4	20	ADDR0	37	IRQ15
4	DATA5	21	DATA0	38	+5V
5	DATA6	22	DATA1	39	CSEL
6	DATA7	23	DATA2	40	N/C
7	CS#1	24	N/C	41	IDE RESET
8	GND	25	GND	42	IO READY
9	GND	26	GND	43	N/C
10	GND	27	DATA11	44	+5V
11	GND	28	DATA12	45	DASP
12	GND	29	DATA13	46	DIAG
13	+5V	30	DATA14	47	DATA8
14	GND	31	DATA15	48	DATA9
15	GND	32	CS#3	49	DATA10
16	GND	33	GND	50	GND
17	GND	34	IO READ		

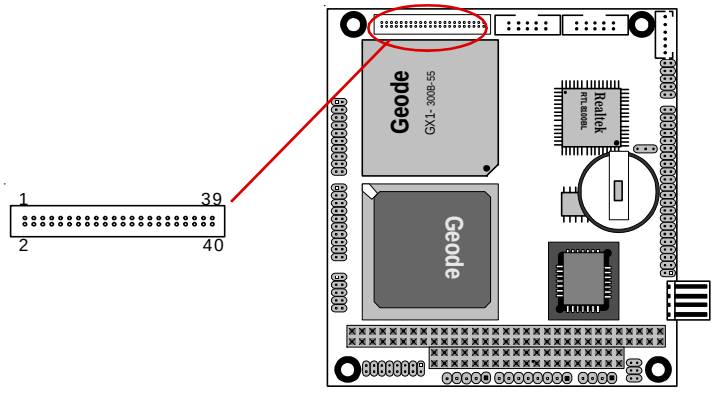


Flat Panel VGA

Connector : **LCD1**
Type : Onboard 40-pin header (20*2 connector)

CS5530A 18-bit

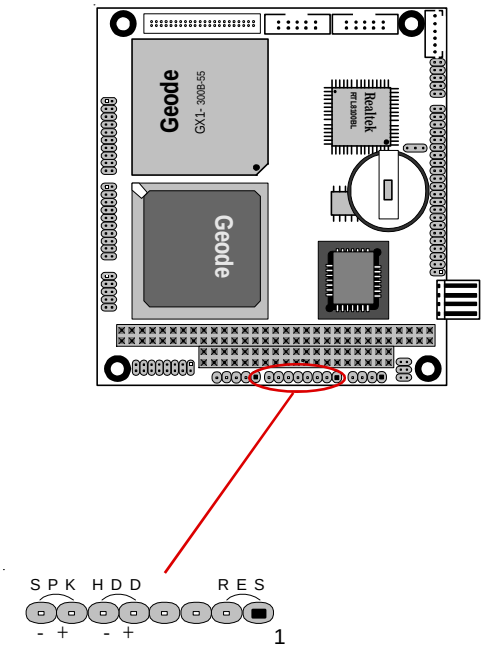
Pin	Description	Pin	Description
1	+5V	2	+5V
3	GND	4	GND
5	+3V	6	+3V
7	VEEP	8	GND
9	R0	10	R1
11	R2	12	R3
13	R4	14	R5
15	G0	16	G1
17	G2	18	G3
19	G4	20	G5
21	B0	22	B1
23	B2	24	B3
25	B4	26	B5
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	GND
35	FPSCLK	36	VSYNC
37	M	38	HSYNC
39	FPVDDEN	40	VBIASEN



Front Panel Connector

Connector : **Front1**
Type : Onboard 8-pin header

Pin	Jumper	Description
1-2	RES	Reset
3-4	NC	
5-6	HDD	Pin-5 is "HDD+",Pin6 is "HDD-"
7-8	SPEAKER	Pin-7 is "SPEAKER+",Pin-8 is "SPEAKER-"



ISA PC-104 Interface

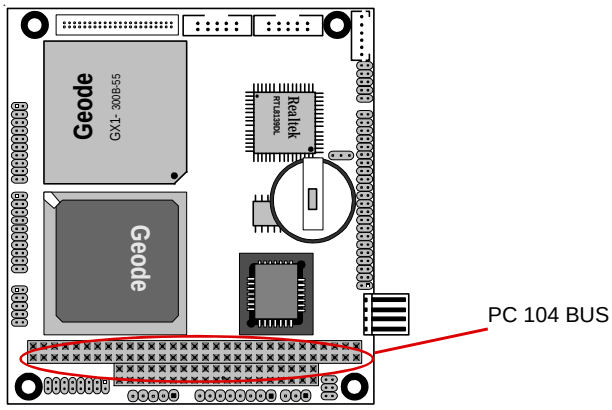
Connector : **PC104 bus**
Type : Onboard 30-pin and 20-pin header

J1 / P1

Pin	A	B
1	IOCHCK*	GND
2	D7	RSTDRV
3	D6	+5V
4	D5	IRQ9
5	D4	-5V
6	D3	DRQ2
7	D2	-12V
8	D1	ENDXFR*
9	D0	+12V
10	IOCHRDY	GND/KEY
11	AEN	SMEMW*
12	A19	SMEMR*
13	A18	IOW*
14	A17	IOR*
15	A16	DACK3*
16	A15	DRQ3
17	A14	DACK1*
18	A13	DRQ1
19	A12	REFRESH*
20	A11	SYSCLK
21	A10	IRQ7
22	A9	IRQ6
23	A8	IRQ5
24	A7	IRQ4
25	A6	IRQ3
26	A5	DACK2*
27	A4	TC
28	A3	BALE
29	A2	+5V
30	A1	OSC
31	A0	GND
32	GND	GND

J2 / P2

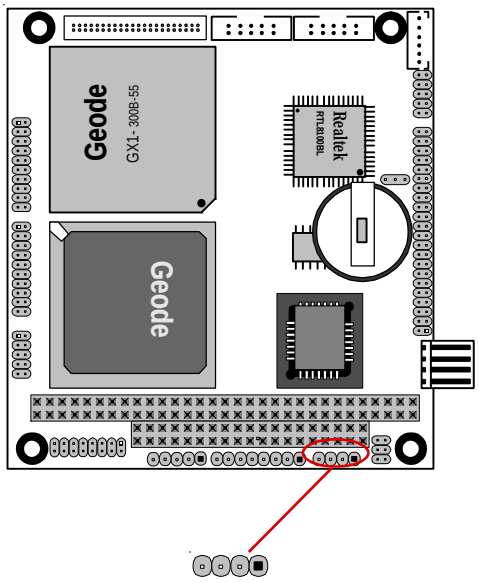
Pin	D	C
0	GND	GND
1	MEMCS16*	SBHE*
2	IOCS16*	LA23
3	IRQ10	LA22
4	IRQ11	LS21
5	IRQ12	LS20
6	IRQ15	LS19
7	IRQ14	LS18
8	DACK0*	LA17
9	DRQ0	MEMR*
10	DACK5*	MEMW*
11	DRQ5	SD8
12	DACK6*	SD9
13	DRQ6	SD10
14	DACK7*	SD11
15	DRQ7	SD12
16	+5V	SD13
17	MASTER*	SD14
18	GND	SD15
19	GND	GND/KEY



LAN Act and Link LED pin header

Connector : **J3**
Type : Onboard 4-pin header

Pin	Description	Pin	Description
1	ACTIVE-	2	ACTIVE+
3	LINK-	4	LINK+



System Resources

Interrupt Assignment

IRQ	Description
0	System Timer
1	Standard 101/103-key or Microsoft Natural Keyboard
2	Programmable Interrupt Controller
3	Communication Port (COM2)
4	Communication Port (COM1)
5	National XpressAUDIO(TM) 16-bit Sound
6	Standard Floppy Disk Controller
7	Parallel Port 1 (LPT1)
8	System CMOS/real time clock
9	Reserve
10	Realtek RTL8139/810x Family Fast Ethernet NIC
12	PS/2 Compatible Mouse Port
13	Numeric data processor
14	Primary Cx5530 Bus Master IDE Controller
15	Secondary Cx5530 Bus Master IDE Controller

I/O Address Space

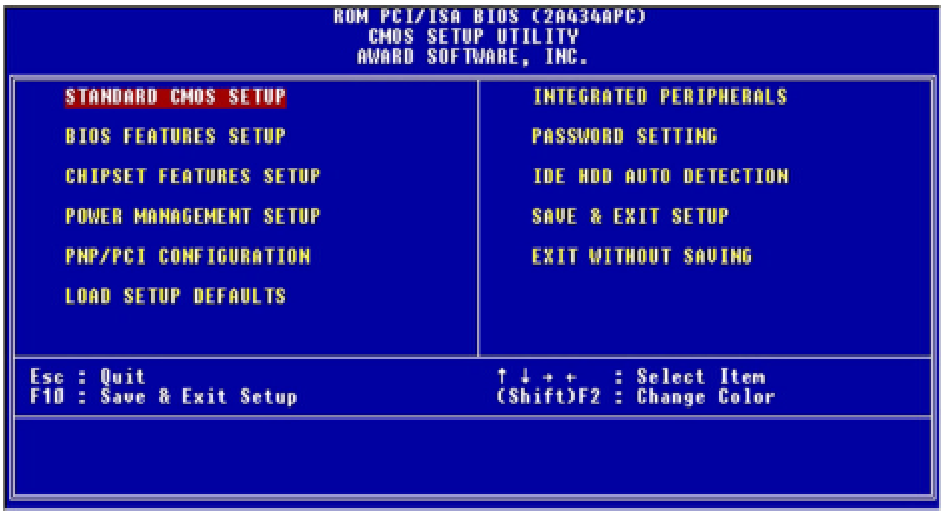
Adress	Description
0000 - 000F	DMA Controller
0020 - 0021	Programmable interrup controller
0040 - 0043	System Timer
0060 - 0060	Standard 101/102-key or Microsoft Natural Keyboard
0061 - 0061	System speaker
0064 - 0064	Standard 101/102-key or Microsoft Natural Keyboard
0070 - 0071	System COM/real time clock
0087 - 0087	Direct memory access controller
0089 - 008B	Direct memory access controller
008F - 0091	Direct memory access controller
00A0 - 00A1	Programmable interrupt controller
00C0 - 00DF	Motherboard Resources
00F0 - 00FF	Nuneric data processor
0170 - 0177	Cyrix 5530 Bus Master PCI to Dual IDE Controller

0170 - 0177	Seoncdary Cx5530 Bus Master IDE Controller
01F0 - 01F7	Cyrix 5530 Bus Master PCI to Dual IDE Controller
01F0 - 01F7	Primary Cx5530 Bus Master IDE Controller
0220 - 022F	National XpressAUDIO(TM) 16-bit Sound
02F8 - 02FF	Communications Port(COM2)
0330 - 0331	National XpressAUDIO(TM) 16-bit Sound
0376 - 0376	Cyrix 5530 Bus Master PCI to Dual IDE Controller
0376 - 0376	Seoncdary Cx5530 Bus Master IDE Controller
0378 - 037F	Printer Port (LPT1)
0388 - 038B	National XpressAUDIO(TM) 16-bit Sound
03F2 - 03F5	Standard Floppy Disk Controller
03F6 - 03F6	Cyrix 5530 Bus Master PCI to Dual IDE Controller
03F6 - 03F6	Primary Cx5530 Bus Master IDE Controller
03F8 - 03FF	Communications Port(C0M1)
0480 - 048F	PCI bus
04D0 - 04D1	PCI bus
0CF8 - 0CFF	PCI bus
E000 - E0FF	Realtek RTL8100BL Family Fast Ethernet NIC
F000 - F00F	Primary Cx5530 Bus Master IDE Controller
F000 - F00F	Cyrix 5530 Bus Master PCI to Dual IDE Controller
F000 - F007	Primary Cx5530 Bus Master IDE Controller
F008 - F00F	Seoncdary Cx5530 Bus Master IDE Controller

AWARD BIOS Setup

The SBC uses the Award PCI/ISA BIOS ver 4.5 for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AWARD PCI/ISA BIOS Setup program, press <Del> key. The Main Menu will be displayed at this time.



Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

STANDARD CMOS SETUP
Use this menu for basic system configuration.

BIOS FEATURES SETUP
Use this menu to set the Advanced Features available on your system.

CHIPSET FEATURES SETUP
Use this menu to change the values in the chipset registers and optimize your system's performance.

Power Management Setup
Use this menu to specify your settings for power management.

PnP / PCI CONFIGRATION
This entry appears if your system supports PnP / PCI.

LOAD SETUP DEFAULTS
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

INTEGRATED PERIPHERALS
Use this menu to specify your settings for integrated peripherals.

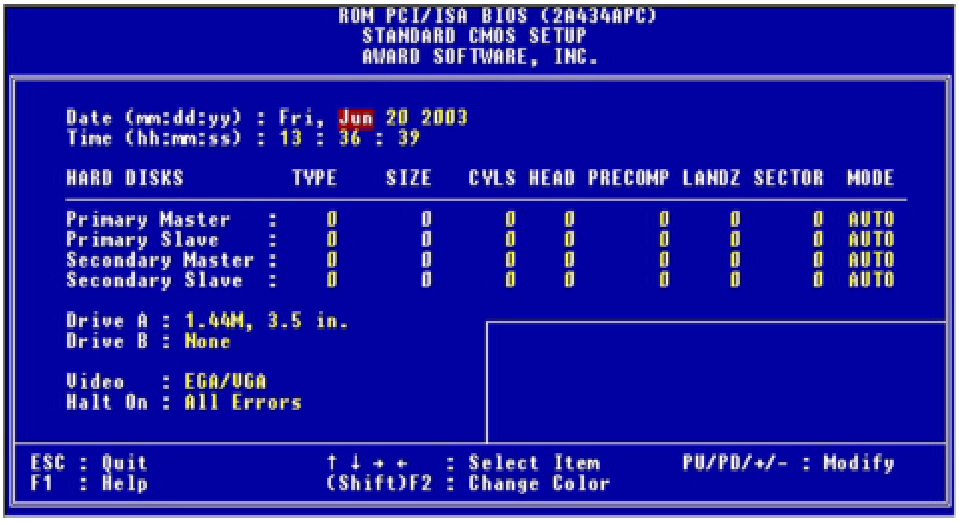
PASSWORD SETTING
Use this menu to set User and Supervisor Passwords.

IDE HDD AUTO DETECTION
System will detect the HDD plugged and recognizes what type it is.

SAVE & EXIT SETUP
Save CMOS value changes to CMOS and exit setup.

EXIT WITHOUT SAVING
Abandon all CMOS value changes and exit setup.

Standard CMOS Setup


ROM PCI/ISA BIOS (2A434APC)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
Date (mm:dd:yy) : Fri, Jun 20 2003
Time (hh:mm:ss) : 13 : 36 : 39
HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master : 0 0 0 0 0 0 0 AUTO
Primary Slave : 0 0 0 0 0 0 0 AUTO
Secondary Master : 0 0 0 0 0 0 0 AUTO
Secondary Slave : 0 0 0 0 0 0 0 AUTO
Drive A : 1.44M, 3.5 in.
Drive B : None
Video : EGA/VGA
Halt On : All Errors
ESC : Quit
F1 : Help
↑ ↓ → ← : Select Item
(Shift)F2 : Change Color
PU/PD/+/- : Modify

-¯®¬:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

Date
The BIOS determines the day of the week from the other date information; this field is for information only.

Time
The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the ? or (key to move to the desired field . Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

IDE Primary Master/Slave
Options are in sub menu (see page 44)

IDE Secondary Master/Slave
Options are in sub menu (see page 44)

Drive A, B
Select the correct specifications for the diskette drive(s) installed in the computer.

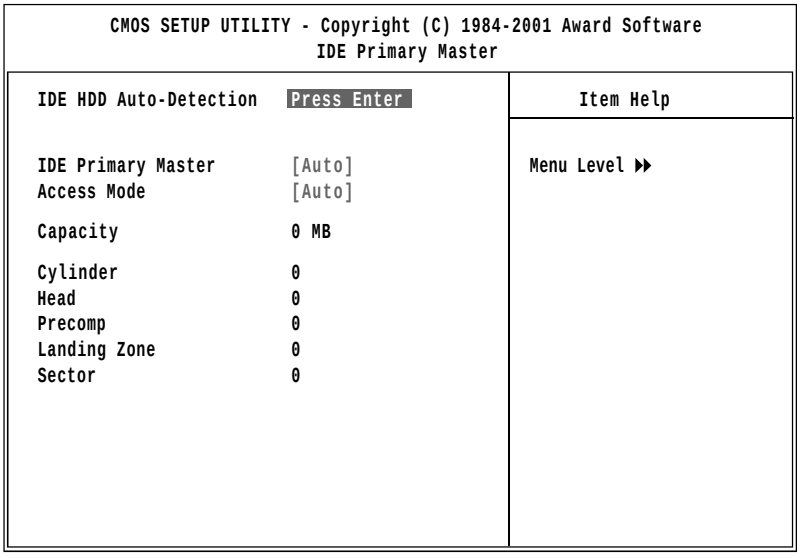
None :	No diskette drive installed
360K ;	5.25 in 5-1/4 inch PC-type standard drive
1.2M ;	5.25 in 5-1/4 inch AT-type high-density drive
720K ;	3.5 in 3-1/2 inch double-sided drive
1.44M ;	3.5 in 3-1/2 inch double-sided drive
2.88M ;	3.5 in 3-1/2 inch double-sided drive

Video Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

Halt On During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors	POST does not stop for any errors.
All errors	If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.
All, But Keyboard	POST does not stop for a keyboard error, but stops for all other errors.
All, But Diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, But Disk/Key	POST does not stop for a keyboard or disk error, but stops for all other errors.

IDE HDD AUTO DETECTION



IDE HDD Auto-detection
Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.

IDE Primary Master
Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !

Capacity
Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

Access Mode
Normal, LBA, Large or Auto Choose the access mode for this hard disk

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder Min = 0 Max = 65535
Set the number of cylinders for this hard disk.

Head Min = 0 Max = 255
Set the number of read/write heads

Precomp Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

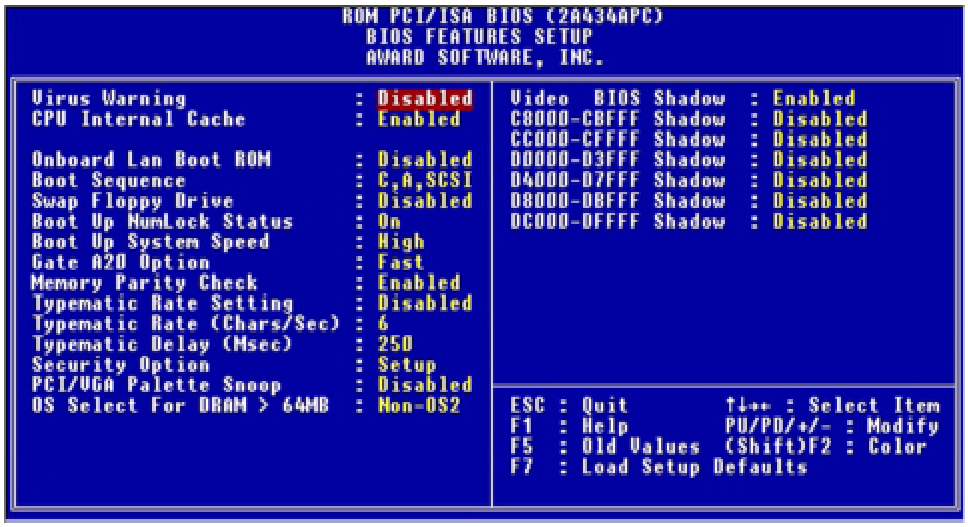
Landing zone Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

Sector Min = 0 Max = 255
Number of sectors per track

We recommend that you select Type "AUTO" for all drives. The BIOS will auto-detect the hard disk drive and CD-ROM drive at the POST stage.

If your hard disk drive is a SCSI device, please select "None" for your hard drive setting.

BIOS Features Setup


ROM PCI/ISA BIOS (2A434APC)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.
Virus Warning : Disabled
CPU Internal Cache : Enabled
Onboard Lan Boot ROM : Disabled
Boot Sequence : C,A,SCSI
Swap Floppy Drive : Disabled
Boot Up NumLock Status : On
Boot Up System Speed : High
Gate A20 Option : Fast
Memory Parity Check : Enabled
Typematic Rate Setting : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec) : 250
Security Option : Setup
PCI/VGA Palette Snoop : Disabled
OS Select For DRAM > 64MB : Non-OS2
Video BIOS Shadow : Enabled
C8000-CBFFF Shadow : Disabled
CC000-CFFFF Shadow : Disabled
D0000-D3FFF Shadow : Disabled
D4000-D7FFF Shadow : Disabled
D8000-DBFFF Shadow : Disabled
DC000-DFFFF Shadow : Disabled
ESC : Quit
F1 : Help
F5 : Old Values
F7 : Load Setup Defaults
↑↓→← : Select Item
PU/PD/+/- : Modify
(Shift)F2 : Color

- ¯ ® ¬ :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

Virus Warning
Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and beep.

Enabled Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU Internal Cache
These two categories speed up memory access. However, it depends on CPU/chipset design. Enabled : Enable cache, Disabled : Disable cache.

Onboard LAN Boot ROM
This feature allows you to run LAN Boot function. Select "Disnabled" not to access this function.

Boot Sequence
The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The choices are : Floppy, HDD, CDROM, Disabled.

Swap Floppy Drive
If the system has two floppy drives, you can swap the logical drive name assignments. The choice: Enabled/Disabled.

Boot Up NumLock Status
Select power on state for NumLock. The choice: Enabled/Disabled.

Boot Up System Speed
This item will speed up the sequence of system POST .

Gate A20 Option
Select if chipset or keyboard controller should control GateA20.
Normal A pin in the keyboard controller controls GateA20
Fast Lets chipset control GateA20

Memory Parity Check
Select Enabled, Disabled and Auto. In Auto mode, the BIOS enables memory checking automatically when it detects the parity DRAM.

Typematic Rate Setting
Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)
Sets the number of times a second to repeat a key stroke when you hold the key down. The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)
Sets the delay time after the key is held down before it begins to repeat the keystroke. The choice: 250, 500, 750, 1000.

Security Option
Select whether the password is required every time the system boots or only when you enter setup.

System The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.

Setup The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

PCI/VGA Palette Snoop
Normally this option is always Disabled! Nonstandard VGA display adapters such as overlay cards or MPEG video cards may not show colors properly.

Setting Enabled should correct this problem. If this field set Enabled, any I/O access on the ISA bus to the VGA card's palette registers will be reflected on the PCI bus. This will allow overlay cards to adapt to the changing palette colors.

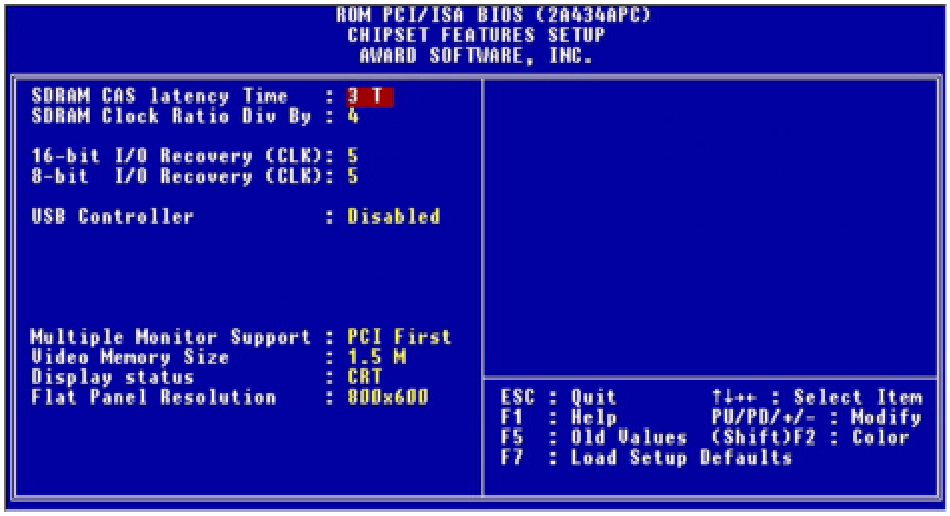
OS Select For DRAM > 64MB
Select the operating system that is running with greater than 64MB of RAM on the system.The choice: Non-OS2, OS2.

Video BIOS Shadow
Enabled this copies the video BIOS from ROM to RAM. effectively enhancing performance, and reducing the amount of upper memory available by 32KB (the C0000~C7FFF area of memory between 640 KB and 1 MB is used).

C8000-CBFFF Shadow
Enabling any of the C8000~CBFFF segments allows components to move their firmware into these upper memory segments. However your computer can lock-up doing so, because some devices don't like being shadowed at those particular 16 KB segments of upper memory.

Note - In Windows 95, double click 'Computer' within Device Manager and select 'Memory'. This will tell you what segments (if any) are being shadowed For DOS you can use MSD.EXE to see what segments are claimed.
CC000-CFFFF - D0000-D3FFF - D4000-D7FFF - D8000-DBFFF and DC000-DFFFF - Same as above.

Chipset Features Setup


ROM PCI/ISA BIOS (2A434APC)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
SDRAM CAS latency Time : 3 T
SDRAM Clock Ratio Div By : 4
16-bit I/O Recovery (CLK): 5
8-bit I/O Recovery (CLK): 5
USB Controller : Disabled
Multiple Monitor Support : PCI First
Video Memory Size : 1.5 M
Display status : CRT
Flat Panel Resolution : 800x600
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F7 : Load Setup Defaults

-¯®¬:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

SDRAM CAS latency Time
It controls the time delay (in clock cycles - CLKs) that passes before the SDRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. Thus, the lower the cycle length, the faster the transaction. However, some SDRAM cannot handle the lower cycle length and may become unstable. So, set the SDRAM Cycle Length to 2T for optimal performance if possible but increase it to 3T if your system becomes unstable.

SDRAM Clock Ration Div By
The function will setup the speed of DRAM .

16-bit I/O Recovery(CLK)
The recovery time is the length of time measured in CPU clocks , whick the system will delay after the completion of an imput/output request . This delay takes place because the CPU is operating so much faster than the input/putput bus that the CPU must be delayed to allow for the completion of the I/O

This item allows to you to derermine the recovery time allowed for 16-bit I/O. Choices are from 1 to 8 CPU Clocks.

8-bit I/O Recovery(CLK)
This item allows to you to derermine the recovery time allowed for 8-bit I/O. Choices are from 1 to 4 CPU Clocks.

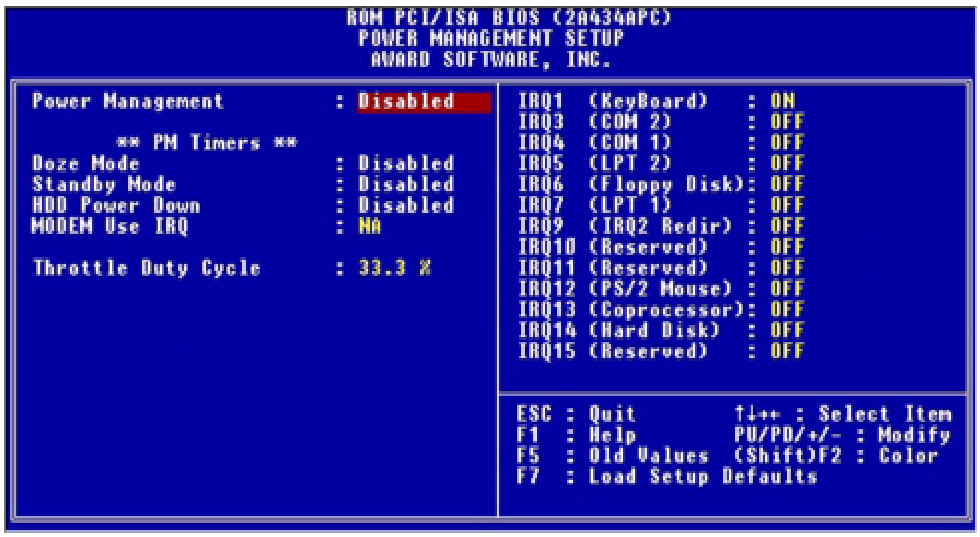
USB Controller
If your system contains a Universal Serial Bus controller and you have a USB peripheral, select Enabled. The next option will become available.

Multiple Monitor Support
This item lets you select the primary VGA interface.

Display status
This item lets you select the primary monitor type.

Flat Panel Resolution
This item lets you select the resolution of Flat Panel.

Power Management Setup


ROM PCI/ISA BIOS (2A434APC)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.
Power Management : Disabled
** PM Timers **
Doze Mode : Disabled
Standby Mode : Disabled
HDD Power Down : Disabled
MODEM Use IRQ : NA
Throttle Duty Cycle : 33.3 %
IRQ1 (KeyBoard) : ON
IRQ3 (COM 2) : OFF
IRQ4 (COM 1) : OFF
IRQ5 (LPT 2) : OFF
IRQ6 (Floppy Disk): OFF
IRQ7 (LPT 1) : OFF
IRQ9 (IRQ2 Redir) : OFF
IRQ10 (Reserved) : OFF
IRQ11 (Reserved) : OFF
IRQ12 (PS/2 Mouse) : OFF
IRQ13 (Coprocessor): OFF
IRQ14 (Hard Disk) : OFF
IRQ15 (Reserved) : OFF
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F7 : Load Setup Defaults

-¯®¬:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

Power Management
Enable the item will enable the power management function.

Doze Mode
After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active.

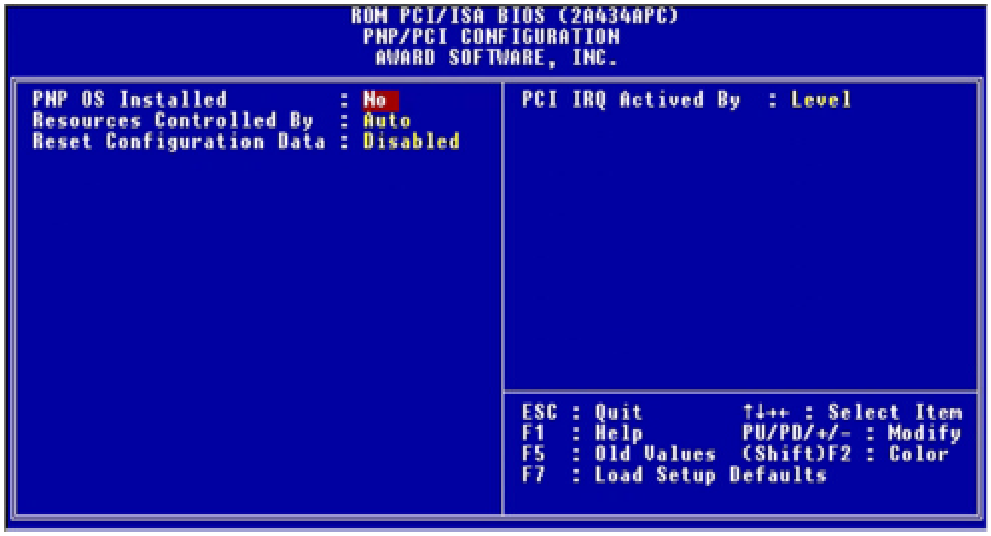
Standby Mode
After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.

HDD Power Down
After the selected period of HDD inactivity, the HDD will be shut down .

Modem Use IRQ
Name the interrupt request (IRQ) assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Throttle Duty Cycle

PnP/PCI Configuration


ROM PCI/ISA BIOS (2A434APC)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.
PNP OS Installed : No
Resources Controlled By : Auto
Reset Configuration Data : Disabled
PCI IRQ Actived By : Level
ESC : Quit ↑↓→← : Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift)F2 : Color
F7 : Load Setup Defaults

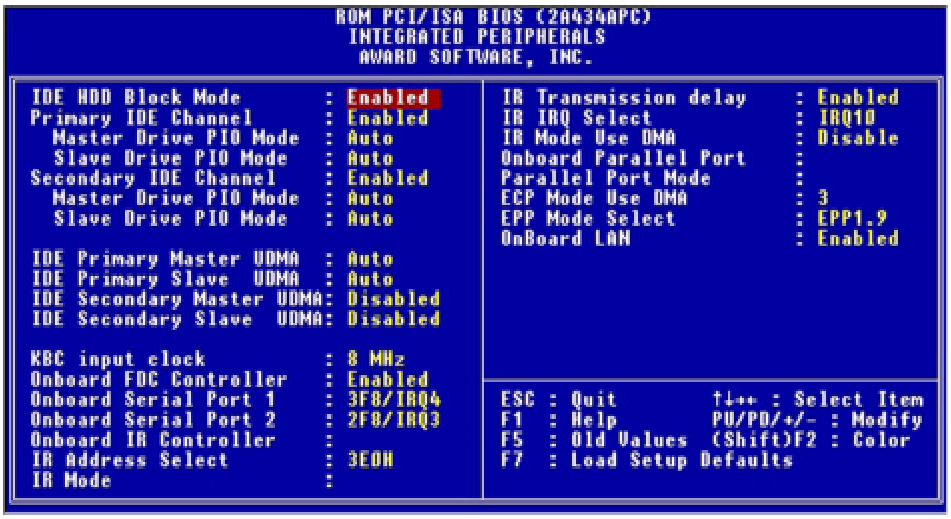
```
- ¯ ® ¬:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values  F6:Fail-SAfe Defaults  F7:Optimized Defaults
```

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

PnP OS Installed
Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

Resource Controlled By
The Award Plug and Play BIOS can automatically configure all the boot and Plug-and-Play compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

Reset Configuration Data
Normally, you leave this field Disabled. Select Enabled to reset ESCD (Extended System Configuration Date) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.


ROM PCI/ISA BIOS (2A434APC)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.
IDE HDD Block Mode : Enabled
Primary IDE Channel : Enabled
Master Drive PIO Mode : Auto
Slave Drive PIO Mode : Auto
Secondary IDE Channel : Enabled
Master Drive PIO Mode : Auto
Slave Drive PIO Mode : Auto
IDE Primary Master UDMA : Auto
IDE Primary Slave UDMA : Auto
IDE Secondary Master UDMA: Disabled
IDE Secondary Slave UDMA: Disabled
KBC input clock : 8 MHz
Onboard FDC Controller : Enabled
Onboard Serial Port 1 : 3F8/IRQ4
Onboard Serial Port 2 : 2F8/IRQ3
Onboard IR Controller :
IR Address Select : 3E0H
IR Mode :
IR Transmission delay : Enabled
IR IRQ Select : IRQ10
IR Mode Use DMA : Disable
Onboard Parallel Port :
Parallel Port Mode :
ECP Mode Use DMA : 3
EPP Mode Select : EPP1.9
OnBoard LAN : Enabled
ESC : Quit
F1 : Help
F5 : Old Values
F7 : Load Setup Defaults
↑↓→← : Select Item
PU/PD/+/- : Modify
(Shift)F2 : Color
-¯®¬:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

IDE HDD Block Mode
This feature enhances disk performance by allowing multi-sector data transfers and eliminates the interrupt handling time for each sector.

Primary/Secondary IDE Channel
Select "Enabled" to activate each on-board IDE channel separately, Select "Disabled", if you install an add-on IDE Control card

Primary & Secondary Master/Slave PIO
These four PIO fields let you set a PIO mode (0-4) for each of four IDE devices. When under "Auto" mode, the system automatically set the best mode for each device

Primary & Secondary Master/Slave UDMA
When set to "Auto" mode, the system will detect if the hard drive supports Ultra DMA mode.

KBC input clock
This item will set the frequence of Keyboard controller.

Onboad FDC Controller
Configuration options: Enabled and Disabled.Enable the Floppy Disk Controller. The default setting is "Enabled".

Onboard Serial Port 1 & 2
Select an address and corresponding interrupt for the first/second serial port. The default value for the first serial port is "3F8/IRQ4" and the second serial port is "2F8/IRQ3".

Onboard IR Controller
This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal.

IR Address Select
This item allows you to determine which I/O address you need .

IR Mode
This item allows you to determine which mode you need (IrDA, ASKIR, Normal).

IR Transmission delay
You can delay the transmission rate of IR for compatibility for other device by seting this item.

IR IRQ Select
This item allows you to determine which IRQ you need .

IR DMA Select
This item allows you to determine which DMA channel you need .

Onboard Parallel Port
Select address and interrupt for the Parallel port.

Parallel Port Mode
Select an operating mode for the parallel port. Mode options are Normal, EPP, ECP, ECP/EPP.

ECP Mode Use DMA
Select a DMA channel if parallel Mode is set as ECP, ECP/EPP.

EPP Mode Select
Select a EPP Type if parallel Port is set as EPP, ECP/EPP.

Onboard LAN
Select "Enabled" if your system contains a LAN port.

POST Codes

The following codes are not displayed on the screen. They can only be viewed on the LED display of a so called POST card. The codes are listened in the same order as the according functions are executed at PC startup. If you have access to a POST Card reader, you can watch the system perform each test by the value that's displayed. If the system hangs (if there's a problem) the last value displayed will give you a good idea where and what went wrong, or what's bad on the system board.

CODE	DESCRIPTION OF CHECK
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved

0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial onboard clock generator if Early_Init_Onboard_Generator is defined. See also POST 26h.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
24h	Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.

25h	Early PCI Initialization: -Enumerate PCI bus number. -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0
26h	1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 2. Init onboard PWM 3. Init onboard H/W monitor devices
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed.
2Ah	Reserved
2Bh	Invoke Video BIOS
2Ch	Reserved
2Dh	1. Initialize double-byte language font (Optional) 2. Put information on screen display, including Award title, CPU type, CPU speed, full screen logo.
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard if Early_Reset_KB is defined e.g. Winbond 977 series Super I/O chips. See also POST 63h.
34h	Reserved
35h	Test DMA Channel 0
36h	Reserved
37h	Test DMA Channel 1.
38h	Reserved
39h	Test DMA page registers.
3Ah	Reserved
3Bh	Reserved

3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program write allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB Keyboard & Mouse.
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Clear password according to H/W jumper (Optional)
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved

57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO 2. Initialize Init_Onbaord_AUDIO.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reset keyboard if Early_Reset_KB is not defined.
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved

71h	Reserved
72h	Reserved
73h	(Reserved
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM? .
76h	(Optional Feature) Enter AWDFLASH.EXE if: -AWDFLASH.EXE is found in floppy drive. -ALT+F2 is pressed.
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Init HDD write protect.
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. - If errors occur, report errors & wait for keys - If no errors occur or F1 key is pressed to continue : wClear EPA or customization logo.
80h	Reserved
81h	Reserved

E8POST.ASM starts

82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. Switch screen back to text mode
86h	Reserved
87h	NET PC: Build SYSID Structure.
88h	Reserved

89h	1. Assign IRQs to PCI devices 2. Set up ACPI table at top of the memory.
8Ah	Reserved
8Bh	1. Invoke all ISA adapter ROMs 2. Invoke all PCI ROMs (except VGA)
8Ch	Reserved
8Dh	1. Enable/Disable Parity Check according to CMOS setup 2. APM Initialization
8Eh	Reserved
8Fh	Clear noise of IRQs
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program Daylight Saving 3. Program boot up speed 4. Chipset final initialization. 5. Power management final initialization 6. Clear screen & display summary table 7. Program K6 write allocation 8. Program P6 class write combining
95h	Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Howto : Flash the BIOS

To flash your BIOS you'll need

1) a xxxxx.bin file that is a file image of the new BIOS

2) AWDFLASH.EXE a utility that can write the data-file into the BIOS chip.

Create a new, clean DOS 6 bootable floppy with "format a: /s".

Copy flash utility and the BIOS image file to this disk.

Turn your computer off. Insert the floppy you just created and boot the computer. As it boots up, hit the [DEL] key to enter the CMOS setup. Go to "LOAD SETUP (or BIOS) DEFAULTS," and then save and exit the setup program. Continue to boot with the floppy disk.

Type "AWDFLASH" to execute the flash utility. When prompted, enter the name of the new BIOS image and begin the flash procedure. Note: If you reboot now, you may not be able to boot again.

After the flash utility is complete, reboot the system.

What to do when the Award flasher says: Insufficient memory

1. In CMOS Chipset Features Setup, Disable Video Bios Cacheable.

2. Hit Esc, F10, Save and exit.

3. Flash the BIOS and reboot

4. Enter CMOS Chipset Features Setup,and Enable Video Bios Cacheable, hit Esc, F10, Save and reboot.

What if things go wrong

if you use the wrong Flash BIOS or if the writing process gets interrupted, there is a fat chance that your computer won't boot anymore.

How can you recover a corrupt BIOS ?

Boot-block booting (this works only for Award BIOS)

Modern motherboards based on Award BIOS have a boot-block BIOS. This is small area of the BIOS that doesn't get overwritten when you flash a BIOS. The boot-block BIOS only has support for the floppy drive. If you have the AGP video enabled you won't see anything on the screen because the boot-block BIOS only supports an ISA videocard.

If you do not want to change your AGP video setting than proceed as follows:

The boot-block BIOS will execute an AUTOEXEC.BAT file on a bootable diskette. Copy an Award flasher & the correct BIOS *.bin file on the floppy and execute it automatically by putting awdflash *.bin in the AUTOEXEC.BAT file.

Solution 2: Hot-swapping

1. Replace the corrupt chip by a working one. The working BIOS doesn't have to be written for your board, it just has to give you a chance of booting to DOS.

BIOSs for the same chipset mostly work. (Chipsets that not differ too much also mostly work. (e.g. Triton FX chipset and Triton HX chipset)

2. Boot the system to DOS (with floppy or HD)

3. Be sure that the System BIOS cacheable option in your BIOS is enabled! If so replace (while the computer is powered on) the BIOS chip with the corrupt one. This should work fine with most boards because the BIOS is shadowed in RAM.

4. Flash an appropriate BIOS to the corrupt chip and reboot.

NOTE: Use a flasher from MRBIOS (**http://www.mrbios.com**). Utilities that come with your motherboard often use specific BIOS-hooks. Because you have booted with a BIOS not written for your motherboard they usually don't work. The MR Flash utilities communicate directly with your Flash Rom and always work. In most cases they flash a non-MRBIOS to your BIOS chip without problems.

Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.